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A method of evaluating an integrated circuit manufacturing process first establishes a "desired" profile of a given film in a prescribed manufacturing process by first recording multiple thickness measures taken at regular intervals along a number of lines crossing a plurality of different sample production runs of the same film formed in the integrated circuit manufacturing process. Next, the invention plots the thickness measures to produce sample film profiles of the film. These sample film profiles are averaged in a statistical process to produce the desired film profile. The desired film profile is compared to an actual production run. If the actual film profile does not match the desired film profile, the integrated circuit manufacturing process used to make the actual film profile can then be adjusted to make the actual film profile match the desired film profile more closely.